

WANNI et al. - 10/848,903
Attorney Docket: P2003J053

IN THE CLAIMS:

The listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A tube support device for a tube bundle having tubes arranged in rows with tube lanes separating the tube rows, the tube support device comprising:

an elongated a longitudinally extending extensive strip having a pair of opposing faces and a plurality of successive transverse tube support rows located at successive longitudinal locations along the strip,

wherein each tube support row having a plurality of raised, tube-engaging zones, wherein at least two of the plurality of raised, tube-engaging zones extend laterally outwards from one of the pair of opposing faces and at least one of the plurality of raised, tube-engaging zones extends laterally outwards from another one of the pair of opposing faces,

wherein the plurality of raised, tube-engaging zones on each face of the strip, extending laterally outwards ~~from both faces of the strip~~ to engage with tubes in the tube bundle on opposite sides of a tube lane.

2. (Original) A tube support device according to claim 1 in which the tube-engaging zones in each transverse row alternately extend outwardly from one face of the strip and the other.

3. (Original) A tube support device according to claim 1 in which the tube engaging zones at corresponding transverse locations in adjacent transverse rows extend outwards from opposite faces of the strip.

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4. (Original) A tube support device according to claim 3 in which each transverse row includes an odd number of raised, tube-engaging zones, with the raised, tube-engaging zones in each row extending successively from opposite faces of the strip.

5. (Original) A tube support device according to claim 1 in which the raised, tube-engaging zones comprise raised dimples which extend outwards from their respective face of the strip.

6. (Original) A tube support device according to claim 1 in which the raised, tube-engaging zones comprise longitudinally extensive corrugations which extend outwards from their respective face of the strip.

7. (Currently Amended) A tube support device ~~according to claim 1~~ for a tube bundle having tubes arranged in rows with tube lanes separating the tube rows, the tube support device comprising:

a longitudinally extensive strip having a plurality of successive transverse rows located at successive longitudinal locations along the strip,

wherein each row having a plurality of raised, tube-engaging zones on each face of the strip, extending laterally outwards from both faces of the strip to engage with tubes in the tube bundle on opposite sides of a tube lane,

wherein at least one in which the transverse rows at one end of the strip comprises raised dimples and,

wherein at least one transverse row at the other end of the strip comprises;
longitudinally extensive corrugations.

8. (Currently Amended) A tube support device according to claim 7, wherein the strip comprising which has a plurality of transverse rows of raised dimples and a plurality

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~~of longitudinally extensive corrugations and a row of raised dimples next to a row of raised corrugations is merged into the row of raised corrugations, each dimple merging into the end of a corrugation in the same longitudinal line along the lengthwise axis of the strip.~~

9. (Original) A tube support device according to claim 7 in which the total depth of the raised dimples from one side of the strip to the other is greater than the total depth of the corrugations from one side of the strip to the other.

10. (Currently Amended) A tube bundle device comprising:

a plurality of tubes arranged in rows with tube lanes separating the tube rows;

at least one tube support device,

wherein the plurality of the tubes being supported by the at least one tube support devices located in the tube lanes,

wherein each tube support device comprising:

an elongated a longitudinally extending extensive strip having a pair of opposing faces and a plurality of successive transverse tube support rows of a plurality of raised tube-engaging zones located at successive longitudinal locations along the strip,

wherein at least two of a the plurality of raised, tube-engaging zones extend laterally outwards from one of the pair of opposing faces and at least one of the plurality of raised, tube-engaging zones extends laterally outwards from another one of the pair of opposing faces,

wherein the plurality of raised, tube-engaging zones on each face of the strip, extending laterally outwards from both faces of the strip to engage with tubes in the tube bundle on opposite sides of a tube lane in the tube bundle.

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11. (Original) A tube bundle device according to claim 10 in which the tube-engaging zones in each transverse row of the tube support devices alternately extend outwardly from one face of the strip and the other.

12. (Original) A tube bundle device according to claim 10 in which the tube engaging zones at corresponding transverse locations in adjacent transverse rows of the tube support devices extend outwards from opposite faces of the strip.

13. (Original) A tube bundle device according to claim 10 in which the raised, tube-engaging zones of the tube support devices comprise raised dimples or longitudinally extensive corrugations which extend outwards from their respective face of the strip.

14. (Original) A tube bundle device according to claim 10 in which the tube engaging zones at the outer ends of the tube support devices at the periphery of the tube bundles comprise raised dimples and the tube-engaging zones away from the periphery of the tube bundle comprising longitudinally extensive corrugations.

15. (Original) A tube bundle device according to claim 14 in which the total depth of the raised dimples from one side of the strip to the other is greater than the total depth of the corrugations from one side of the strip to the other.

16. (Original) A tube bundle device according to claim 10 in which the tubes in the tube bundle are arranged in rectangular formation with orthogonal rows of tubes and tube lanes, and in which the tubes are supported by tube support devices located in tube lanes, each tube support device comprising a longitudinally extensive strip having a plurality of pairs of successive transverse rows of raised tube-engaging zones, the pairs of rows being located at successive longitudinal locations along the strip, each transverse

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row having a plurality of raised, tube-engaging zones on each face of the strip extending laterally outwards from both faces of the strip to engage with a pair of adjacent tubes on opposite sides of the tube lane with each pair of adjacent transverse rows of raised, tube-engaging zones engaging with a pair of adjacent tubes on opposite sides of the tube lane.

17. (Original) A tube bundle device according to claim 10 in which the tubes in the tube bundle are arranged in rectangular formation with orthogonal rows of tubes and tube lanes, and in which the tubes are supported by tube support devices located in tube lanes, each tube support device comprising a longitudinally extensive strip having a plurality of successive transverse rows of raised longitudinally-extensive corrugated tube-engaging zones, the rows being located at successive longitudinal locations along the strip, each transverse row having a plurality of the raised, longitudinally-extensive corrugated tube-engaging zones on each face of the strip extending laterally outwards from both faces of the strip to engage with a pair of adjacent tubes on opposite sides of the tube lane.

18. (Original) A tube bundle device according to claim 10 in which the tubes in the tube bundle are arranged in rectangular formation with orthogonal rows of tubes and tube lanes, and in which the tubes are supported by tube support devices located in tube lanes, each tube support device comprising a longitudinally extensive strip having a plurality of successive transverse rows of raised longitudinally-extensive corrugated tube-engaging zones, the rows being located at successive longitudinal locations along the strip, each transverse row having a plurality of the raised, longitudinally-extensive corrugated tube-engaging zones on each face of the strip extending laterally outwards from both faces of the strip to engage with a pair of adjacent tubes on opposite sides of the tube lane, with each pair of transverse, adjacent rows of tube-engaging zones engaging with a pair of adjacent tubes on opposite sides of the tube lane.

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19. (Original) A tube bundle device according to claim 10 in which the tubes in the tube bundle are arranged in rectangular formation with orthogonal rows of tubes and tube lanes and in which the tubes are supported by tube support devices located in tube lanes, each tube support device comprising a longitudinally extensive strip having a plurality of successive transverse rows of raised dimples at the outer ends of the tube support devices at the periphery of the tube bundles and longitudinally-extensive corrugated tube-engaging zones away from the periphery of the tube bundle, the rows being located at successive longitudinal locations along the strip, each successive pair of transverse rows of dimples engaging with a pair of adjacent tubes on opposite sides of the tube lane in which the support device is located and each successive transverse row of longitudinal corrugations engaging with a pair of adjacent tubes on opposite sides of the tube lane.

20. (Original) A tube bundle device according to claim 10 in which the tubes in the tube bundle are arranged in triangular formation with rows of tubes in staggered, alternating-row arrangement and tube lanes between the tube rows, in which the tubes are supported by tube support devices located in the tube lanes, each tube support device comprising a longitudinally extensive strip having a plurality of successive transverse rows of raised tube-engaging zones, the transverse rows being located at successive longitudinal locations along the strip, each transverse row having a plurality of raised, tube-engaging zones on each face of the strip extending laterally outwards from both faces of the strip to engage with a pair of adjacent tubes in adjacent tube rows on opposite sides of the tube lane.

21. (New) A tube support device according to claim 8, wherein one row of raised dimples is positioned next to a row of raised corrugations such that each dimple merges into the end of a corrugation in the same longitudinal line along the lengthwise axis of the strip.

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22. (New) A tube support device according to claim 1, wherein the tubes on opposite sides of the tube lane deflect a predetermined amount when the tube support device is inserted in the tube lane.

23. (New) A tube bundle device according to claim 10, wherein the tubes on opposite sides of the tube lane deflect a predetermined amount when the tube support device is inserted in the tube lane.